

Problem B. Bob and Alice

Input file: *standard input*
Output file: *standard output*
Time limit: 1 second
Memory limit: 1024 mebibytes

Bob and Alice are playing a game. First, they agree on a number x , and select a sequence of length N , denoted as a_1, a_2, \dots, a_N .

The game proceeds as follows: Bob and Alice take turns, with **Bob going first**. During a player's turn, they must perform the following actions:

- Select a subset S of indices from 1 to N .
- For each $i \in S$, choose a **divisor** d_i of x , and modify a_i into $a_i / \gcd(a_i, d_i)$.
- Note that the divisors d_i selected for each i do not need to be the same.
- The action is valid as long as at least one number in the sequence is reduced in value.

Of course, the player who cannot perform a valid action loses the game.

Given the sequence, you need to determine, for $x = 1, 2, \dots, K$, whether Bob or Alice will win, assuming both play optimally.

Input

The first line of input contains two integers, N and K : the length of the sequence and the number of queries you need to answer ($1 \leq N \leq 3 \cdot 10^5$; $1 \leq K \leq 10^6$).

The next line contains N integers a_1, a_2, \dots, a_N , the contents of the sequence ($1 \leq a_i \leq 10^6$).

Output

Output a string of length K , denoted as $s_1 s_2 \dots s_K$, where the character s_i represents who wins the game when the initial number is $x = i$. The character "B" denotes that Bob wins, and "A" denotes that Alice wins.

Examples

<i>standard input</i>	<i>standard output</i>
4 6 4 5 4 9	AAABBA
6 10 3 1 4 1 5 9	AABBBBABBB